

### **REMARKS**

Applicant thanks the Examiner for the courtesy extended to its representative during the interview on January 30, 2006. During the interview, Applicant argued that Vig is silent with respect to a Y' axis and, therefore, a quartz plate having sides parallel to an X'' and a Z'' axis which has been rotated within angles -35 to -2 degrees in the clockwise direction about the Y' axis would not have been obvious in view of Vig. The Examiner asserted that Vig teaches a doubly rotated cut. Based on this teaching, the Examiner alleged that although Vig does not explicitly teach a Y' axis, the teaching and rotation about a Y' axis is inherent.

Claims 1-4 remain pending in the application. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks contained herein.

### **REJECTION UNDER 35 U.S.C. § 103**

Claims 1, 3, and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over John R. Vig, Technical Report No. SLCET-TR-88-1 ("Vig"). This rejection is respectfully traversed.

Claim 1 recites that the quartz plate has sides parallel to an X'' axis and a Z'' axis, respectively, which have been rotated within angles of from about -35 to -2 degrees in the clockwise direction about the Y' axis that is a thickness direction of the cut of the piezoelectric resonator. Rotation about the Y' axis is described at, for example, paragraph [0033] of the specification.

Vig does not teach or suggest a quartz plate having sides parallel to an X'' axis and a Z'' axis which have been rotated within angles of from about -35 to -2 degrees in the clockwise direction about the Y' axis that is a thickness direction of the cut of the piezoelectric resonator,

as claimed. Vig merely teaches a double-rotation piezoelectric oscillator. There is no teaching, suggestion, or motivation in Vig that would lead one skilled in the art to utilize a cut of a piezoelectric actuator having sides parallel to an X'' axis and a Z'' axis which have been rotated within angles of from about -35 to -2 degrees in the clockwise direction about the Y' axis that is a thickness direction of the cut of the piezoelectric resonator.

During the aforementioned interview, the Examiner stated that Vig inherently teaches the claimed Y' axis. Applicant assumes that the Examiner is asserting that the Y' axis is inherent because in Vig (p.3-17), it appears that the "doubly rotated cut" and a "Y axis" meet at right angles.

Notwithstanding, Vig merely teaches a double-rotation quartz plate but not to double rotate it about a Y' axis as claimed. Therefore, it is not obvious to rotate a double-rotation quartz plate about a Y' axis. A technical problem that the claimed invention attempts to solve is that a double-rotation oscillator provides more undesired spurious oscillations than a conventional AT-cut oscillator. The cause is the direction of displacement of thickness shear oscillation that is the main oscillation. The claimed solution is rotating with an angle of  $\Omega$  about the Y' axis (as claimed: rotating with angles of from -35 to -2 degrees in the clockwise direction). Please see the paragraphs 10-11, 34-37 and 42 of the specification.

The claimed invention calls for a cut of a piezoelectric oscillator and a piezoelectric oscillator that comprises a quartz plate having a double-rotation quartz plate which has been rotated within the plane about Y' axis. Vig fails to teach or suggest such an arrangement.

Further, the claimed invention, unlike Vig, provides a specific solution to the technical problem regarding the cause of too many spurious oscillations. Vig does not disclose or suggest any of these technical matters but merely teaches a double-rotation quartz plate (which is

identified as prior art in the background of the invention in applicant's specification). The skilled artisan would not look to Vig for a solution to the technical problem the claimed invention solves.

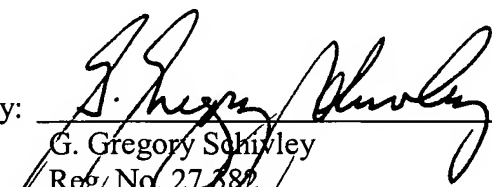
Because the above aspects of the claimed invention is neither taught nor suggested, claim 1 and each corresponding dependent claims would not have been obvious in view of Vig.

### CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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